

CLAIMS

1. A method of monitoring the location of a mining vehicle in a mine, the method comprising:

determining data on the location of at least one mining vehicle (1, 1a, 1b) in the mine (17);

transmitting the location data to a mine control system (11); and

employing the obtained location data in the mine control system (11) for monitoring the operation of the mining vehicle (1, 1a, 1b);

characterized by

forming at least one first section (17) and at least one second section (21) in the mine;

creating at least one wireless network (10) for the first mine section (18, 20) which communicates with the mine control system (11) and includes at least one base station (13, 13a to 13c) for establishing a data communication connection between the mining vehicle (1, 1a, 1b) and the wireless network (10), the mining vehicle (1, 1a, 1b) being in the coverage area of at least one base station (13, 13a to 13c) in the first mine section (18, 20);

arranging at least one base station (13d) in the second mine section (21) for establishing a data communication connection between the mining vehicle (1, 1a, 1b) and the wireless network (10);

determining the location of the mining vehicle (1, 1a, 1b) in the first mine section (18, 20) by means of positioning performed in the wireless network (10); and

determining the location of the mining vehicle (1, 1a, 1b) in the second mine section (21) by at least one measuring device provided in the mining vehicle (1, 1a, 1b) and transmitting the location data to the mine control system (11) over the wireless network (10).

2. A method according to claim 1, **characterized by**

determining the location of the mining vehicle (1, 1a, 1b) in the second mine section (21) by calculating the distance (M) travelled and determining the direction (S) of travel.

3. A method according to claim 1 or 2, **characterized by**

monitoring the location of a manned mining vehicle (1, 1a, 1b) in the mine (17), and

transmitting instructions to the operator (16) of the mining vehicle (1, 1a, 1b) on the basis of the monitoring carried out.

4. A method according to any one of the preceding claims, **characterized** by

forming the first mine section in a connecting tunnel (20), and
forming the second mine section in a production tunnel (21).

5. A method according to any one of the preceding claims, **characterized** by

determining the location of the mining vehicle (1, 1a, 1b) continuously by at least one measuring device provided in the mining vehicle,

comparing the location determined by the measuring device with the location determined by the wireless network (10) when in the first mine section (18, 20), and

updating the location of the mining vehicle (1, 1a, 1b) to correspond to the location determined by the wireless network (10).

6. A method according to any one of the preceding claims, **characterized** by

placing additional base stations (13e) belonging to the wireless network in predetermined critical locations (22) in the mine (17), and

registering the visits of the mining vehicle (1, 1a, 1b) to the coverage area of the additional base stations (13e) in the mine control system (11).

7. A system for monitoring the location of a mining vehicle in a mine, the system comprising:

means for determining the location of the mining vehicle (1, 1a, 1b);
a mine control system (11);

at least one control unit (8) arranged in the mining vehicle;

at least one wireless network (10) for data transmission between the control unit (8) of the mining vehicle and the mine control system (11); and

at least one base station (13, 13a to 13c) for creating a wireless network (10),

characterized in that

the mine (17) comprises at least one first section (18, 20) provided with at least one wireless network (10), the mining vehicle (1, 1a, 1b) being in the coverage area of at least one base station (13, 13a to 13c) in the first mine section (18, 20);

the mine (17) comprises at least one second section (21) provided with at least one base station (13d) for establishing a data communication connection between the control unit (8) of the mining vehicle and the mine control system (11);

the location of the mining vehicle (1, 1a, 1b) in the first mine portion (18, 20) is arranged to be determined using positioning performed in the wireless network (10);

the location of the mining vehicle (1, 1a, 1b) in the second mine portion (21) is arranged to be determined by at least one measuring device provided in the mining vehicle (1, 1a, 1b), and

location data are arranged to be transmitted in the second mine section (21) over the wireless network (10) from the mining vehicle (1, 1a, 1b) to the mine control system (11).

8. A system according to claim 7, **characterized** in that the wireless network (10) is a radio telephone network.

9. A system according to claim 7 or 8, **characterized** in that the mining vehicle (1, 1a, 1b) comprises at least one measuring device for determining the distance (M) travelled and at least one measuring device for determining the direction (S).

10. A system according to claim 7 to 9, **characterized** in that the first mine section (18, 20) is provided with at least one predetermined critical location (22), and

at least one additional base station (13e) is arranged in the immediate vicinity of the critical location (22).

11. A system according to any one of preceding claims 7 to 10, **characterized** in that

the positioning to be performed in the wireless network (10) is arranged to be carried out on the basis of the location of the base station (13, 13a to 13e).